

Utah State Implementation Plan

Section IX, Part D

8-HOUR OZONE MAINTENANCE PROVISIONS FOR SALT LAKE AND DAVIS COUNTIES

Adopted by the Air Quality Board

December 6, 2006

Table of Contents

1. Introduction	1
a. Maintenance Plan Overview	1
b. Historical Background	1
2. Attainment Emission Inventory	3
a. Point Source Emissions	5
b. Area Source Emissions	5
c. Mobile Source Emissions	6
(1) On-Road Emissions	6
(2) Non-Road Emissions	7
d. Biogenic Emissions	7
3. Maintenance Demonstration	8
a. Base Year and Projected Emission Inventories	8
b. Methodology for Projecting Emissions	11
(1) Point Sources	11
(2) Area Sources	11
(3) Mobile Sources	11
(4) Biogenic Emissions	11
4. Monitoring Network/Demonstration of Continued Attainment	12
a. Ozone Monitoring Network	12
b. Ozone Monitoring Data	14
c. Review of Monitoring Network	15
5. Existing Regulations and Controls	16
a. Reasonably Available Control Technology (RACT)	16
(1) VOC Sources Covered by a CTG issued after 1990 – CAA 182(b)(2)	16
(2) VOC Sources Covered by a CTG issued before 1990	16
(3) Major Stationary Sources that are not covered by a CTG	16
(4) New Sources of VOC	17
b. NO _x Requirements under Section 182(f) of the CAA	17
c. Rate of Progress (ROP) Reductions	18
d. Inspection and Maintenance (I/M) Programs	18
e. Major Source Applicability Cut-offs for Purposes of RACT	18
f. Requirements that Do Not Apply	18
g. Control Measure Carried Forward from the 1-hour Ozone Plan	19

REPLACES Existing Ozone SIP and Maintenance Plan

6. Contingency Measures.....	20
a. Purpose of Contingency Planning	20
b. Determination of the Contingency Trigger Level and Date.....	20
c. Timeliness of Contingency Actions	21
d. Possible Contingency Measures.....	21
7. Verification of Continued Ozone Maintenance.....	23
a. Tracking System for the Verification of the Emission Inventory	23
b. Provisions for Revising the Maintenance Plan	23
c. Provisions for Prohibiting Transport of Emissions to Other States.....	23

List of Tables

Table 1.	Salt Lake and Davis Counties Source Category Totals for VOC (tons/day)	4
Table 2.	Salt Lake and Davis Counties Source Category Totals for NOx (tons/day)	5
Table 3.	Salt Lake and Davis Counties Individual Monitor 4 th Highest Ozone and Three-Year Average 4 th Highest Ozone Values (ppm)	14
Table 4.	Salt Lake County-I/M Performance Standard	18
Table 5.	Davis County I/M Performance Standard	18

List of Figures

Figure 1.	Salt Lake and Davis Counties 2002 Source Percentage of VOC	4
Figure 2.	Salt Lake and Davis Counties 2002 Source Percentage of NOx	5
Figure 3.	Salt Lake and Davis Counties VOC Projections through 2018 (tons/day)	9
Figure 4.	Salt Lake and Davis Counties 2002 and 2014 VOC Sources	9
Figure 5.	Salt Lake and Davis Counties NOx Projections through 2018	10
Figure 6.	Salt Lake and Davis Counties 2002 and 2014 NOx Sources	10
Figure 7.	Ozone Monitoring Network within Salt Lake and Davis Counties	13
Figure 8.	Three-Year Period Ozone Averages (1993-1005)	15

REPLACES Existing Ozone SIP and Maintenance Plan

List of Acronyms Used in this Document

ACT	Alternative Control Technique
AIRS	Aerometric Information Retrieval System (an EPA database)
AO	Approval Order
AQB	(Utah) Air Quality Board
BACT	Best Available Control Technology
BEIS2	Biogenics Emission Model
CAA	Federal Clean Air Act, amended in November 1990
CTG	Control Technique Guidance Document
CFR	Code of Federal Regulations
DAQ	Division of Air Quality
EDMS	Emissions and Dispersion Modeling System
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
HPMS	Highway Performance Monitoring System
I/M	Inspection and Maintenance Program for automobiles
KUC	Kennecott Utah Copper Corporation
LTO	Landing and Take Off
MACT	Maximum Achievable Control Technology, established under Title III of the CAA
MNR	Monitoring Network Review
MOBILE6	A model for mobile source emissions
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Station
NO _x	Oxides of Nitrogen
NONROAD	A model for non road source emissions
NSR	New Source Review
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 microns
RACT	Reasonably Available Control Technology
RVP	Reid Vapor Pressure
SBAP	Small Business Assistance Program
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Station
T/D	Tons per Day
T/Y	Tons per Year
TSD	Technical Support Document
UDOT	Utah Department of Transportation
UDEQ	Utah Department of Environmental Quality
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WFRC	Wasatch Front Regional Council

D. OZONE MAINTENANCE PLAN

1. Introduction

The State of Utah has developed this maintenance plan for the 8-hour National Ambient Air Quality Standard (NAAQS) in accordance with Section 110(a)(1) of the Clean Air Act (CAA). Salt Lake and Davis Counties were found to be in attainment on July 18, 1995 (60 FR 36723) under the 1-hour ozone NAAQS and have been operating under an approved maintenance plan (62 FR 38213) since July 17, 1997. This maintenance plan demonstrates that Salt Lake and Davis Counties have achieved the 8-hour ozone standard and can maintain compliance with the standard through 2014. The remainder of the State of Utah is currently designated unclassifiable/attainment.

a. Maintenance Plan Overview

This maintenance plan uses an emission inventory approach and demonstrates that projected future emissions will be less than base year emissions. Emission inventories used in this maintenance plan were developed for an actual typical summer day using 2002 as the base year with projections for the years 2005, 2008, 2011, and 2014.

Federal approval of this maintenance plan is necessary to enable the State of Utah to maintain its ozone attainment/maintenance designation under the new 8-hour NAAQS.

b. Historical Background

The original CAA required areas failing to meet the federal ambient ozone standard to develop State Implementation Plans (SIP) with sufficient control requirements to expeditiously attain and maintain the standard. In 1977, Weber, Davis, Utah and Salt Lake Counties were designated non-attainment for ozone. In 1981 the EPA re-designated Weber and Utah Counties as attainment for ozone. In April of 1981, an ozone SIP was submitted to EPA that demonstrated attainment of the standard for both Davis and Salt Lake Counties by May 1, 1984. This ozone SIP submittal was fully approved by the EPA.

In November of 1990, Congress amended the Federal CAA. As a result, Salt Lake and Davis Counties were designated as “moderate” non-attainment areas based on ambient monitoring data for 1988 and 1989. On November 12, 1993 Utah submitted a formal request to EPA that the Salt Lake/Davis County non-attainment area be re-designated to attainment of the NAAQS, and the State, in accordance with the Act, submitted a maintenance plan. In June of 1994, on the basis of a reorganized state submittal and a parallel processing request, EPA issued a finding of “completeness” effective May 12, 1994. On January 5, 1995, the Ozone Maintenance Plan for Salt Lake and Davis Counties was revised. In April of 1995 volatile organic compound (VOC) Reasonably Available Control Technology (RACT) commitments were updated and in August of

1 1995 the contingency measures were revised to be consistent with language in the 1990 amended
2 CAA.

3
4 By March of 1996, the Utah Division of Air Quality (DAQ) had obtained 1994 inventory data
5 and had developed a more realistic methodology for projecting non-road emissions. Since there
6 were no violations or exceedances of the ozone standard in 1994, and since there existed
7 sufficient inventory data, DAQ prepared a new revision of the plan in which 1994 was established
8 as the attainment year inventory for the demonstration of maintenance through the year 2007.
9 The Utah Air Quality Board (AQB) adopted this revision on June 5, 1996.

10
11 By October of 1996, both Salt Lake and Davis Counties had finalized the details of the
12 improvements to their vehicle inspection and maintenance (I/M) programs, which would be fully
13 implemented in 2000 and 1998 respectively. The maintenance plan was revised to reflect the
14 actual I/M programs that would be used in the area. The State also requested an exemption from
15 additional oxides of nitrogen (NO_x) RACT requirements under section 182(f) of the CAA
16 because the area had already attained the ozone standard and additional reductions were not
17 needed to show maintenance of the standard. In July of 1997, the EPA approved the Ozone
18 Maintenance Plan and NO_x RACT exemption for Salt Lake and Davis Counties, effective August
19 18, 1997, and re-designated both counties to attainment for ozone.

20
21 In July of 1997, the EPA established a new, more rigorous standard for ozone. The new
22 8-hour standard was set at a level of 0.08 parts per million (ppm) averaged over an eight-hour
23 period. To take into account extreme and variable meteorological conditions that can influence
24 ozone formation, a violation of the standard occurs when the three-year average of the fourth-
25 highest, maximum value at a monitor exceeds the federal standard. Due to numerical rounding
26 conventions, a violation occurs when the three-year average of the 4th highest daily 8-hour
27 average ozone concentration is equal to or greater than 0.085 ppm.

28
29 On April 30, 2004 (69 FR 23951), EPA published the first phase of its final rule (Phase I Rule) to
30 implement the 8-hour ozone NAAQS. At the same time EPA also published 8-hour ozone
31 designations for all areas of the country. All areas of Utah were designated attainment or
32 unclassifiable. These designations became effective on June 15, 2004. The Phase I rule provided
33 that the 1-hour ozone NAAQS would no longer apply (i.e. be revoked) one year following the
34 effective date of the 8-hour ozone NAAQS, or June 15, 2005. This revocation action was
35 affirmed at 70 FR 44470 on August 3, 2005.

36
37 EPA issued final guidance for the development of the 8-hour ozone CAA Section 110(a)(1)
38 maintenance plan on May 20, 2005. On November 29, 2005, EPA published the "Final Rule to
39 Implement the 8-hour Ozone National Ambient Air Quality Standard (NAAQS) - Phase II."
40 (70 FR 71611)

41
42 This maintenance plan was developed in accordance with the guidance and directions included
43 therein.

2. Attainment Emission Inventory

Requirements relating to Attainment Emission Inventory:

- *The state can choose to demonstrate maintenance of the NAAQS using an emissions inventory approach. This approach requires the development of an "attainment emission inventory" to identify the level of emissions in the area that are sufficient to maintain the standard.*
- *The attainment emission inventory should be consistent with EPA guidance, and should include emissions during the time period associated with the monitoring data showing attainment. EPA recommended using the 2002 emission inventory.¹*

Ozone is a gas composed of three oxygen atoms. Ozone at ground level, where it can be inhaled, is a pollutant. It is rarely emitted directly into the air, but rather is the result of a complex chemical reaction between volatile organic compounds (VOC) and oxides of nitrogen (NO_x). These compounds, when combined in the presence of intense sunlight, may cause ground-level ozone to form in harmful concentrations in the air.



This SIP is based on emission inventories of VOC and NO_x, and documents that future emission levels of these precursors to ozone will be lower than present levels. As recommended by the EPA, the State of Utah has chosen to use 2002 as the attainment base year for this maintenance plan. An emission inventory for 2002 was developed to provide a base from which to evaluate future emissions. The emissions inventory is divided into four major source categories: point sources, area sources, mobile sources, and naturally occurring biogenic sources. Mobile sources are further divided into on-road and non-road categories. A short discussion of each of these categories will follow after Figure 2. A more in-depth discussion of each category is included in the Emission Inventory section of the Technical Support Document (TSD).

As required by EPA, DAQ applied rule effectiveness based on the revised rule effectiveness guidance found in Appendix B of EPA-454/R-005-01 entitled "Emissions Inventory Guidance of Ozone and Particulate Matter National Ambient Air Quality Standard (NAAQS) and Regional Haze Regulations." Rule effectiveness is a measure of the ability of the regulatory program to achieve all of the emission reductions possible by full compliance with applicable rules at all covered sources at all times. It reflects the assumption that rules are not typically 100 percent effective at all times.

A summary of the emission inventory for the 2002 base year with interim projections to 2014 is represented in Tables 1 and 2 for a typical summer day during the ozone season (June – August). Figures 1 and 2 represent relative percentages of 2002 emissions by source type. The 2002

¹ Each subdivision of this Plan begins with a summary of the requirements set forth in EPA's *Maintenance Plan Guidance Document for Certain 8-hour Ozone Areas Under Section 110(a)(1) of Clean Air Act*, May 30, 2005.

emission inventory, in its entirety, is included in the TSD. A graphical depiction of the emission projections for 2005-2014 and the maintenance demonstration can be found in the next subsection of this plan.

Table 1. Salt Lake and Davis Counties Source Category Totals for VOC (tons/day)

VOC	2002	2005	2008	2011	2014
Point Source	11.24	11.21	11.66	11.96	12.36
Area Source	89.14	92.27	96.14	101.69	107.54
Biogenic Source	120.26	120.26	120.26	120.26	120.26
Mobile On Road	57.66	44.70	35.36	29.11	24.52
Non-Road	29.55	25.47	20.90	18.42	16.57
Total (tons/day)	307.85	293.91	284.32	281.44	281.25
Attainment	307.85	307.85	307.85	307.85	307.85

Figure 1. Salt Lake and Davis Counties 2002 Source Percentage of VOC

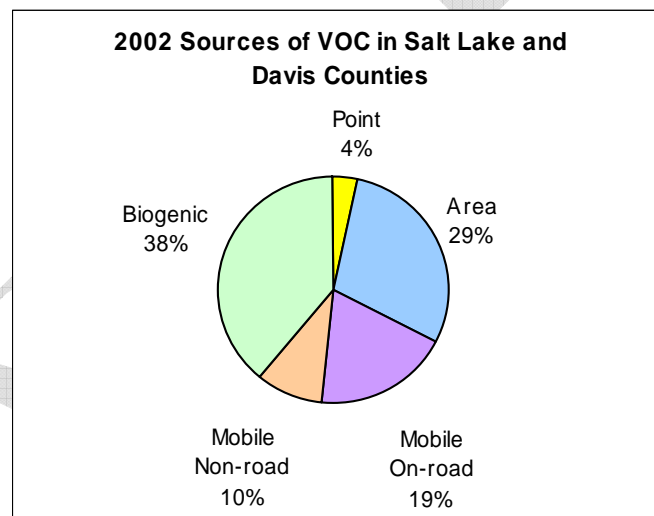
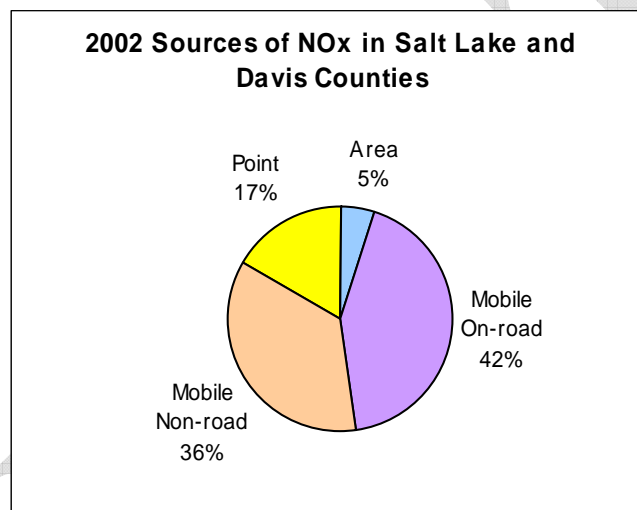


Table 2. Salt Lake and Davis Counties Source Category Totals for NO_x (tons/day)

NO _x	2002	2005	2008	2011	2014
Point Source	39.27	38.09	37.78	36.75	36.82
Area	11.36	10.08	10.79	11.82	12.82
Mobile On-Road	98.89	85.52	65.47	49.45	35.92
Non-Road	83.87	80.35	72.56	63.48	51.30
Total	233.39	214.04	186.60	161.50	136.86
Attainment	233.39	233.39	233.39	233.39	233.39

Figure 2. Salt Lake and Davis Counties 2002 Source Percentage of NO_x



a. Point Source Emissions

Sources included in the point source portion of the attainment year inventory include all stationary sources with actual annual emissions of 100 tons or more of VOC or NO_x. Stationary sources with 2002 actual annual emissions of less than 100 tons of VOC or NO_x were included in the area source portion of the inventory. The 2002 emissions inventory for stationary point sources is based on actual activity levels during the peak ozone season and reflects estimated actual emissions. In compliance with EPA guidance, emission estimates were adjusted to reflect current rule effectiveness guidance.

b. Area Source Emissions

The area source inventory estimates VOC and NO_x emissions by county. This inventory includes sources whose annual emissions from any single source location are less than 100 tons for VOC or NO_x. Non-road mobile source emissions such as aircraft maintenance and engine emissions, railroad switch engine and line-haul emissions, and miscellaneous emissions from all other non-road sources are included in the area source inventory, but reported separately as the non-road emission inventory.

1 as discussed below. The area source inventory was examined for double counting of emissions
2 already included in the state's point source inventory and adjusted accordingly. All emission
3 estimates in the area source inventory were reported in tons-per-peak-ozone-season day to reflect
4 conditions most typical of higher ozone concentrations.

5
6 Area source emissions include small stationary sources such as gasoline stations and degreasing
7 operations that are controlled through VOC regulatory rules. VOC emissions from vehicle refueling
8 are also included in the area source emissions inventory. In compliance with EPA guidance, emission
9 estimates for area sources covered by existing rules were adjusted to reflect current rule effectiveness
10 guidance. These categories included asphalt paving, yard waste burning, municipal solid waste
11 (MSW) burning, and gasoline transport vehicles.

12 13 **c. Mobile Source Emissions**

14
15 Emissions from on-road mobile sources include all VOC and NO_x from automobiles, trucks, and
16 motorcycles designed for travel on established federal, state, or local roads. Calculated emissions
17 from these vehicles are in the form of tailpipe exhaust, evaporation from the engine and fuel systems,
18 and any other vapor losses during the running and resting of the vehicles.

19
20 Emissions from non-road mobile sources include tailpipe exhaust, evaporation from the engine
21 and fuel systems of vehicles and construction equipment operated on unpaved roads, exhaust
22 emissions or vapor losses resulting from the operation of railroad locomotives, airplanes,
23 recreational, lawn and garden equipment, and from any other portable petroleum-fueled
24 equipment.

25
26 VOC refueling emissions resulting from vehicle refueling at gasoline, ethanol, or natural gas
27 stations are considered area emissions.

28
29 (1) *On-Road Emissions.* The on-road emissions inventory was generated by combining
30 VOC and NO_x emission factors with estimates of peak summer weekday vehicle miles traveled
31 (VMT) in Salt Lake and Davis Counties. Calculated on-road mobile emissions are aggregated by
32 county for a peak ozone weekday. Details on the methodology used to compute emission
33 estimates for the on-road mobile source inventory are delineated in the on-road emission
34 inventory TSD.

35
36 Emission factors were derived from the EPA's mobile sources emissions model, MOBILE6 that
37 provides emission factors for vehicle exhaust tailpipe emissions and evaporative emissions. The
38 September 2003 version of MOBILE6, MOBILE6.1/6.2, incorporates the current federal tailpipe
39 standards required by the CAA. It allows users to input local parameters that describe the vehicle
40 fleet, vehicle emission control programs, the road network, fuel properties and meteorological
41 conditions for the peak ozone weekday.

42
43 All MOBILE6 parameters involving I/M and the anti-tampering programs were measured,
44 estimated, or confirmed by the Salt Lake County and Davis County Health Departments who
45 administer these programs in their respective jurisdictions.

46
47 Utah Department of Transportation (UDOT) staff issues an annual report entitled *VMT by*
48 *Functional Class*. This summary report tabulates actual VMT in average-annual-daily traffic.
49 VMT is obtained from the Highway Performance Monitoring System (HPMS) database and

1 reports VMT for twelve functional roadway classes in each city and county in the state. The
2 Wasatch Front Regional Council (WFRC) regroups UDOT VMT from twelve to four classes;
3 freeway, ramp, arterial, and local roads. The WFRC Travel Demand Model adjusts the annual
4 average daily VMT to average-summer-weekday VMT using conversion factors provided within
5 the model. The conversion factors and methods are explained in the TSD for on-road mobile
6 sources.

7
8 Since the HPMS model does not estimate vehicle speeds, the WFRC supplied vehicle speed
9 estimates for 2002 using the most recent population, employment, travel, road network, and
10 traffic congestion data.

11
12 (2) *Non-Road Emissions.* Emissions from non-road mobile sources include releases from
13 railroad locomotives, airplanes, recreational vehicles, construction equipment, lawn and garden
14 equipment, and any other non-road petroleum-fueled vehicle or equipment.

15
16 (a) Trains. The two railroad companies operating within Salt Lake and Davis
17 Counties submitted reports of their locomotive activities. Line-haul activity was reported
18 in terms of fuel usage while yard activity was reported in terms of number of yard
19 locomotives. These data were combined with emission factors published in EPA's
20 "Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources" (EPA
21 420-R-92-009) to estimate peak-ozone-day emissions.

22
23 (b) Aircraft Engines. The WFRC studied and summarized the airport activity of
24 commercial, military, and private aircraft at each airport within the Salt Lake and Davis
25 County area. They reported landing and take off (LTO) counts for specific aircraft types.
26 To further refine commercial aircraft emissions, the publication *Airport Activity Statistics*
27 *of Certificated Route Air Carriers* provided an itemized list of aircraft makers, models
28 and the number of flights. Using the EPA/FAA Emission and Dispersion Modeling
29 System (EDMS) version 4.04 software package, emissions of VOC and NO_x per LTO
30 were calculated. The numbers of LTOs during an ozone day were estimated to produce
31 peak-ozone-day emissions.

32
33 (c) Other Non-Road Engines. This section presents the 2002 base year inventory
34 of emissions from non-road engines other than trains and airplanes. Emissions were
35 estimated for each of 212 non-road engine categories and then totaled. Emissions from
36 non-road engine categories associated with the construction, manufacturing, mining and
37 agricultural industries were based on EPA NONROAD version 2004.

38 39 **d. Biogenic Emissions**

40
41 Biogenic emissions are natural VOC losses from forests, field crops, and all other plant matter
42 growing or decomposing within the maintenance area. These emissions were calculated using
43 EPA's BEIS 3.12 model, and incorporated into the emissions inventory for Salt Lake and Davis
44 Counties. Based on future long-range land use planning for the area, these emissions are forecast
45 to remain relatively constant throughout the period covered by this maintenance plan.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

3. Maintenance Demonstration

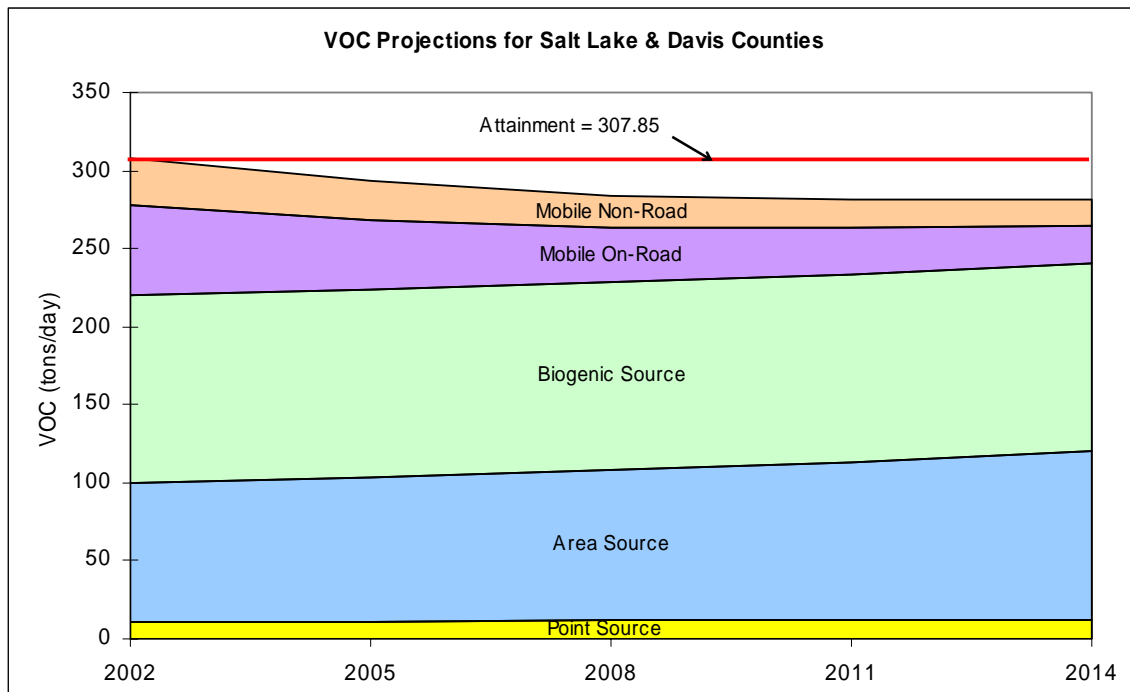
Requirement relating to Maintenance Demonstration:

- *A Maintenance Demonstration is a compilation of Projection inventories that demonstrate how an area will remain in compliance with the 8-hour ozone standard for the ten-year period following the effective date of designation as unclassifiable or attainment. For areas with an effective date of designation for the 8-hour NAAQS of June 15, 2004, the end projection year shall be 2014 and must show attainment.*

a. Base Year and Projected Emission Inventories

The attainment emission inventory reported in section IX.D.2 documents a level of emissions in Salt Lake and Davis County that is sufficient to maintain the 8-hour NAAQS for ozone through 2014. Emissions projections for each source category are used to determine if expected emission levels in future years will exceed the 2002 attainment emission inventory level. Maintenance of the NAAQS is demonstrated if the projected emissions remain below the 2002 level. Figures 3 and 5 graphically demonstrate that the projected VOC and NO_x emission inventories remain below the 2002 level, through the year 2014. Summary tables showing VOC and NO_x peak ozone season daily emissions in tons/day are included in the TSD.

**Figure 3. VOC Projections through 2018 for Salt Lake and Davis Counties
(tons/day)**



Figures 4 and 6 give a pictorial look at the sources of VOC and NO_x for the attainment year of 2002 and the end projection year of 2014.

Figure 4. Salt Lake and Davis Counties 2002 and 2014 VOC Sources

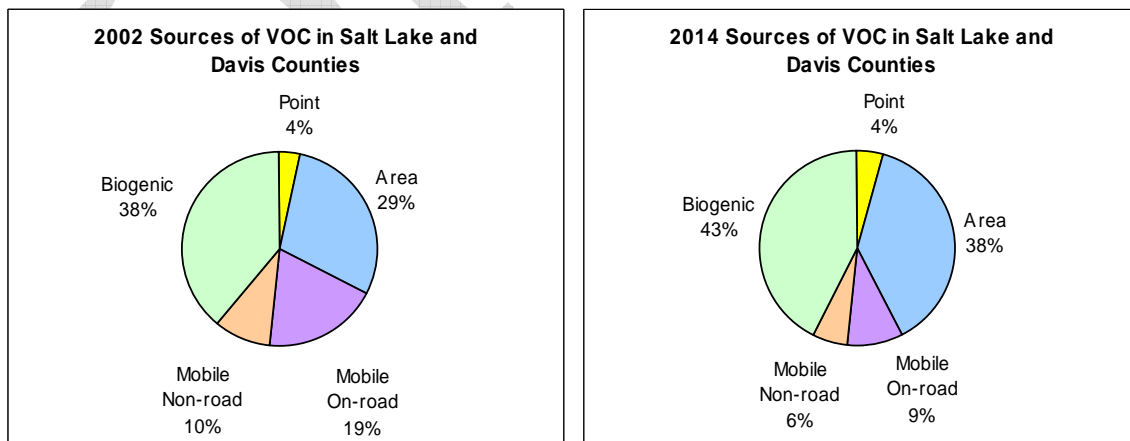


Figure 5. NO_x Projections through 2018 for Salt Lake and Davis Counties (tons/day)

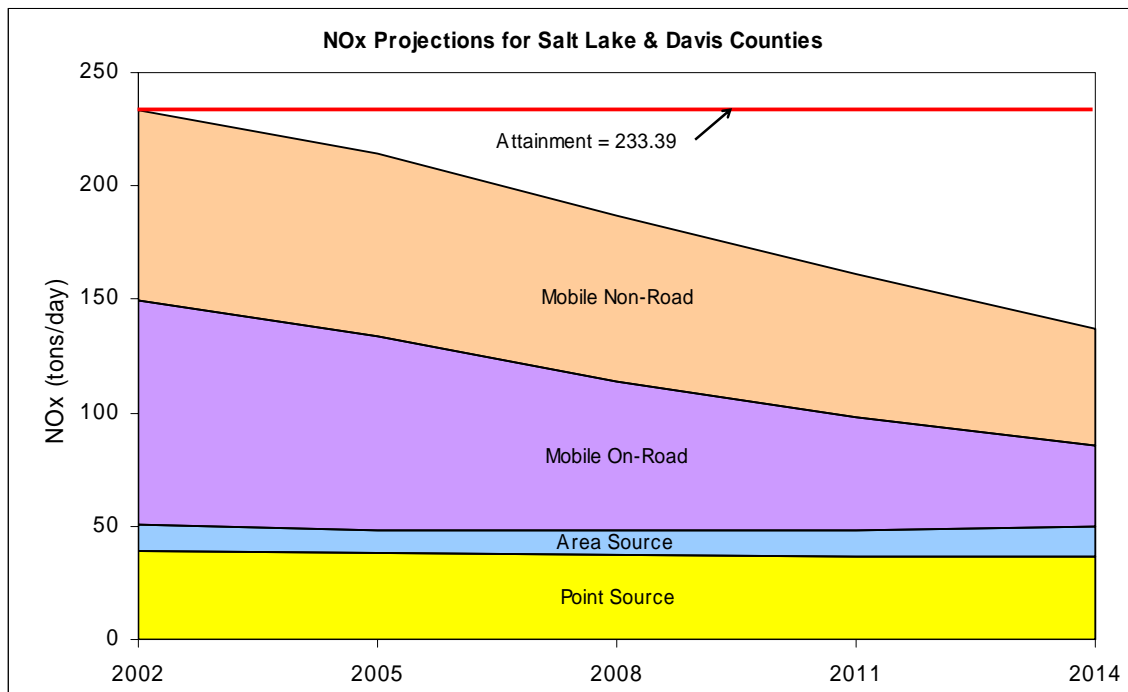
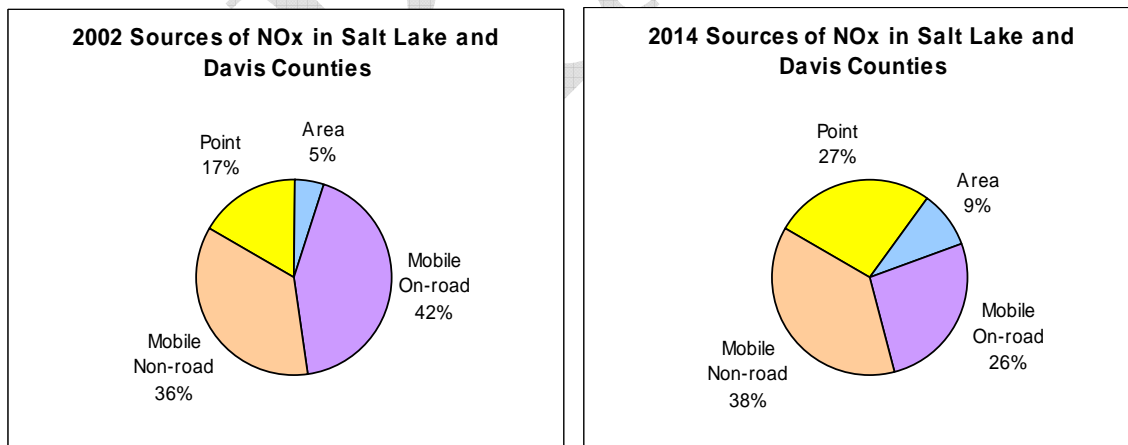


Figure 6. Salt Lake and Davis Counties 2002 and 2014 NO_x Sources



The Utah DAQ will track the progress of this maintenance plan by periodically reviewing future emission inventories to verify that emission levels of VOC and NO_x do not surpass those presented in Subsection 2 above.

A short discussion of how emissions were projected for each of the major source categories follows. Additional discussion is provided in the Emission Inventory section of the TSD.

b. Methodology for Projecting Emissions

(1) *Point Sources.* Employment growth factors published by the Demographic and Economic Analysis section of the Governor's Office of Planning and Budget were used to project point source emissions.

The point source attainment year inventory contains a listing of emissions by individual sources that compose each plant's actual emissions. The reliability of these projections is reinforced by the continued maintenance of existing rules (R307-325 through 342) that regulate the operations of all VOC sources in Salt Lake and Davis Counties. The New Source Review (NSR) rules that specify pollution control requirements for any new sources or modifications to existing sources also reinforce the reliability of this emission projection inventory.

(2) *Area Sources.* Growth factors for estimating end projection year emissions for area sources were based on the most recent population and sector-specific employment growth data published by the Governor's Office of Planning and Budget.

(3) *Mobile Sources.* Projected mobile source emissions were broken down into on-road and non-road categories described below.

(a) *On-Road Emissions.* Projected on-road emissions for future years are generated by combining VOC and NO_x emission factors with projections of average summer weekday vehicle miles traveled (VMT) within Salt Lake and Davis Counties. VMT projections are obtained from the WFRC Travel Demand Model.

(b) *Non-Road Emissions.* Projected non-road emissions were broken down into railroad engines, aircraft engines, and miscellaneous non-road equipment categories as described below.

(i) *Railroad Engines.* Growth factors for estimating projection year emissions are based on industrial employment growth derived from the Governor's Office of Planning and Budget. Emissions were estimated to increase at the rate of employment growth within the Transportation, Communications, and Public Utilities segments of industry.

(ii) *Aircraft Engines.* Growth figures for all aircraft emissions in Salt Lake and Davis Counties were provided by the Wasatch Front Regional Council (WFRC). These growth figures are applied to the daily emissions calculated in the 2002 attainment inventory to obtain emissions projections through 2014.

(iii) *Miscellaneous Non-Road Equipment.* EPA's NONROAD version 2004 software was run for all projection years.

(4) *Biogenic Emissions.* Biogenic emissions will remain constant in Salt Lake and Davis Counties unless significant changes occur in land use, which is not anticipated. The typical summer day emissions were calculated by taking the average of June, July, and August total emissions.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33

4. Monitoring Network/Demonstration of Continued Attainment

Requirement related to Ozone Monitoring:

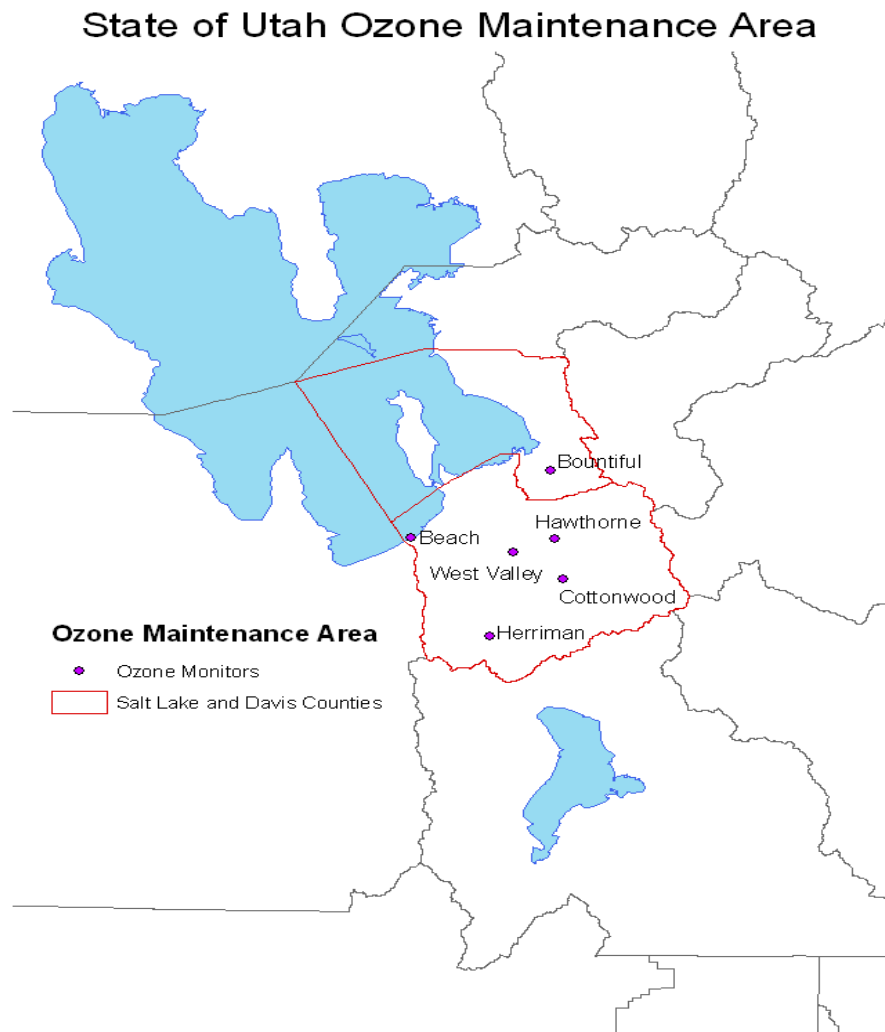
- *Three consecutive years of Ozone monitoring data must show that violations of the standard have not occurred. The standard is the annual fourth-highest daily maximum 8-hour ozone concentration, expressed in parts per million, averaged over three years. Thus the three-year average of the annual fourth-highest daily 8-hour average ozone concentration must not exceed 0.08 ppm to meet the standard. Due to rounding conventions, the fourth-highest daily 8-hour average ozone concentration may not exceed 0.084 ppm.*

a. Ozone Monitoring Network

Information regarding ozone monitoring in Utah is included in the Monitoring Network Review (MNR). Since the early 1980s the MNR has been updated annually and submitted to the EPA for approval. EPA personnel have concurred with the annual network reviews and agreed that the network is adequate. They have also visited the monitoring sites on several occasions to verify compliance with federal siting requirements. The ozone monitoring season in Utah is May through September (40 CFR Part 58, Appendix D, 2.5). The highest ozone values usually occur during the months of June, July and August.

The valley setting of Salt Lake and Davis Counties complicates ozone monitoring of the major urban area along the Wasatch Front. Typical ozone monitoring at sites on flat terrain in wide-open spaces find the peak ozone monitoring station located 5 – 7 hours down wind from the urban area. Because Salt Lake and Davis Counties have a large body of water on their west side (Great Salt Lake) and a major mountain range (Wasatch) on their east side, summer wind patterns result in a diurnal on-shore/off-shore wind flow. This pattern suggests that after 5 – 7 hours the polluted air mass may in fact return to the urban area where the ozone precursors originated. Figure 7 depicts the relative locations of the ozone-monitoring network within Salt Lake and Davis Counties.

1 **Figure 7. Ozone Monitoring Network within Salt Lake and Davis Counties**



3
4 The following ozone monitoring stations were operating in Salt Lake and Davis Counties during
5 the period 1999 through 2005. Pertinent ozone monitoring station data is delineated below with
6 additional information in the TSD.

7
8 **Beach** (AIRS ID #49-035-2004). This site is located at the Great Salt Lake Marina close
9 to the western border of Salt Lake County. The site has been in existence for many years
10 to measure PM₁₀ and SO₂. Ozone monitoring equipment was added to the site as a result
11 of an ozone saturation study that showed high concentrations of ozone in this area. The
12 ozone monitoring equipment began operating on May 17, 1994.

13
14 **Bountiful** (AIRS ID # 49-011-0004). In the city of Bountiful in Davis County, ozone has
15 been measured at two different locations since February of 1975. On July 22, 2003 the

monitoring station was moved approximately three-quarters of a mile north to the current location at 171 West 1370 North on the grounds of Viewmont High School. The move was necessitated by the construction of a new city fire station on the original site. The new site is in a similar residential setting, centrally located and representative of a large part of the city of Bountiful.

Cottonwood (AIRS ID # 49-035-0003). Based on wind trajectories this site was determined to be the site that would measure the maximum ozone concentration in the Salt Lake area. It is located in a residential area approximately nine miles south of the Central Business District. Monitoring began at this site in December of 1980.

Hawthorne (AIRS ID # 49-035-3006). This site is located in a residential area near downtown Salt Lake City. It is representative of a large part of Salt Lake City. Monitoring began at this site on January 1, 1997.

Herriman (AIRS ID #49-035-3008). This site is located in the southwest corner of the Salt Lake Valley in a predominantly rural area. The site was added as a result of a 1993 ozone saturation study that showed high concentrations of ozone in this area. The ozone monitoring equipment began operating on May 1, 1994.

West Valley (AIRS ID # 49-35-3007). West Valley City is the second largest city in the State of Utah and is located in the north central area of the Salt Lake valley. This site was chosen to determine ozone concentrations in an area where a large percentage of the population is clustered. Monitoring at this site began on January 21, 1999.

b. Ozone Monitoring Data

Table 3 represents monitoring data for the Salt Lake and Davis County monitoring sites. For each site, the 4th maximum 8-hour ozone concentration along with the three-year average of the 4th maximum ozone concentration is presented.

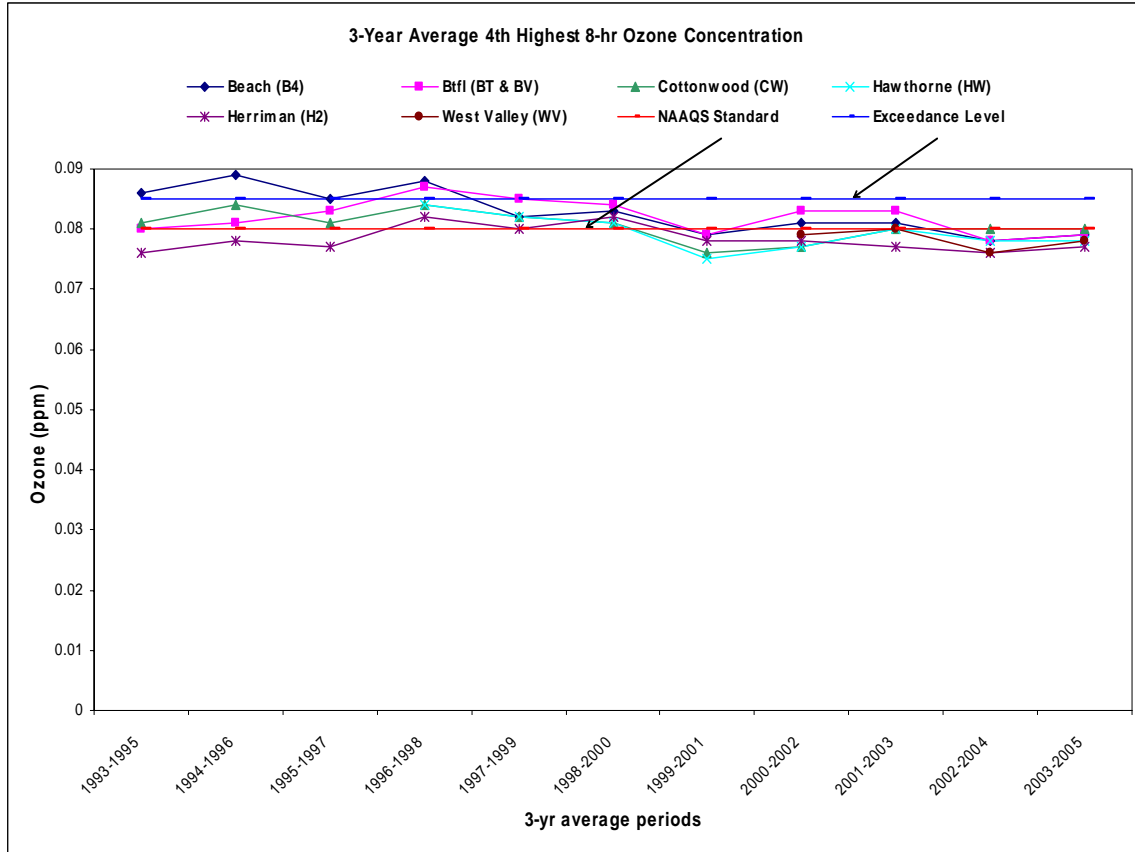
Table 3. Salt Lake and Davis Counties Individual Monitor 4th Highest Ozone and Three-Year Average 4th Highest Ozone Values* (ppm)

Monitoring Site	2000	2001	2002	2003	2004	2005	2000-02 8 hr avg	2001-03 8-hr avg	2002-04 8-hr avg	2003-05 8-hr avg
Beach	0.078	0.082	0.083	0.077	0.075	0.086	0.081	0.081	0.078	0.079
Bountiful	0.078	0.081	0.089	0.079	0.067	0.092	0.083	0.083	0.078	0.079
Cottonwood	0.072	0.076	0.082	0.083	0.074	0.084	0.077	0.080	0.080	0.080
Hawthorne	0.073	0.075	0.084	0.081	0.069	0.083	0.077	0.080	0.078	0.078
Herriman	0.081	0.076	0.078	0.076	0.074	0.080	0.078	0.077	0.076	0.077
West Valley	0.074	0.084	0.079	0.078	0.071	0.085	0.079	0.080	0.076	0.078
Avg 4 th High	0.076	0.079	0.083	0.079	0.072	0.085	0.079	0.080	0.078	0.079

* **Bold** values represent exceedance of National Ambient Air Quality Standard

Figure 8 depicts the three-year 4th highest ozone concentration average trend since the 1993-1995 periods.

Figure 8. Three-Year Period Ozone Averages (1993-2005)



c. Review of Monitoring Network

The existing monitoring network for ozone consists of thirteen monitoring sites located primarily in the populated counties along the Wasatch Front. DAQ considers the present configuration appropriate to reflect the current source and population areas in Salt Lake and Davis Counties. The DAQ will gain EPA approval before making any changes to the current monitoring network configuration. The DAQ will continue to operate and maintain an adequate air quality monitoring network in accordance with 40 CFR 58, *Ambient Air Quality Surveillance*, to verify the continued attainment of the 8-hour ozone NAAQS. The DAQ will continue to conduct annual reviews of the ozone monitoring network in accordance with 40 CFR 58.20(d) to determine whether the system continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58.

5. Existing Regulations and Controls

Requirements relating to existing regulations:

- *Anti-backsliding provisions established in 40 CFR 51.905(a)(4) ensure that emission control strategies that were implemented to address the 1-hour ozone standard are maintained when the area transitions to an 8-hour maintenance plan. The applicable requirements that are listed in 40 CFR 51.900(f) must be maintained, unless the state requests that these obligations be shifted to contingency measures.*

Utah has maintained the requirements in this plan as described below.

a. Reasonably Available Control Technology (RACT)

The State certifies that all existing RACT controls required in the 1981 Ozone SIP and 1-hour maintenance plan dated September 9, 1998, will remain in effect after approval of this SIP revision.

(1) VOC Sources Covered by a CTG issued after 1990 – CAA 182(b)(2).

Negative Declaration - In the 1-hour maintenance plan, Utah determined that there were no VOC sources covered by a Control Technique Guideline (CTG) issued after 1990.

(2) VOC Sources Covered by a CTG issued before 1990. In the 1981 SIP and the 1-hour and Maintenance Plan, dated September 9, 1998, the State of Utah established required controls under Section 182(b)(2) of the CAA. Utah is currently enforcing a set of RACT regulations that are based on CTGs developed by EPA. These state RACT regulations are implemented by the following rules in the Utah Administrative Code.

- R307-325 General Requirements
- R307-326 Control of Hydrocarbon Emissions in Refineries
- R307-327 Petroleum Liquid Storage
- R307-328 Gasoline Transfer and Storage
- R307-335 Degreasing and Solvent Cleaning Operations
- R307-340 Surface Coating Operations
- R307-341 Cutback Asphalt
- R307-342 Qualifications of Contractors and Test Procedures for Vapor Recovery Systems for Gasoline Delivery Tanks

(3) Major Stationary Sources that are not covered by a CTG. The State of Utah has identified the following major sources (100 t/y or more) of VOC emissions in the Salt Lake and Davis County attainment area. RACT for these major stationary sources that are not covered by specific CTGs or ACTs is listed below. In addition, NO_x emission limitations for most of these major sources are presented in Subsection IX.H.2 of the SIP.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49

Major Source Name	Type of Source
-------------------	----------------

Chevron	Refinery
Flying J	Refinery
Holly Refining and Marketing (Formerly Phillips)	Refinery
Pioneer Investments	Gasoline Bulk Terminal
Silver Eagle (Formerly Crysen)	Refinery
Tesoro West Coast (Formerly Amoco)	Refinery
Hill Air Force Base	Military Installation

NOTE: *Olympia Sales, which was a major source in the previous 1-hour maintenance plan, is no longer a major source. Its emissions are now covered by the Maximum Achievable Control Technology (MACT) requirements for Wood Furniture (40 CFR 63 Subpart JJ), which is more stringent than RACT.*

(a) Refineries. VOC RACT for the five refineries and one bulk terminal plant located in Salt Lake and Davis Counties is established by R307-326, 327 and 328.

(b) Hill Air Force Base - RACT for Hill Air Force Base is established by a combination of MACT Standards (40 CFR 63), NSPS Standards (40 CFR 60), and operationally-specific-state rules (R307-327, 328, 335 and 340) that currently regulate over eighty-six percent of the total VOC emissions originating from Hill Air Force Base. The remaining fourteen percent of the VOC emissions generated at Hill Air Force Base will be regulated by the forthcoming Military MACT. In addition, VOCs produced by refrigerant processes are controlled by 40 CFR 82 (Stratospheric Ozone).

(4) *New Sources of VOC.* Any new major or minor source permitted in the future in the ozone maintenance area will be required to meet the Best Available Control Technology (BACT) requirements delineated in R307-401, that will be at least as stringent as RACT.

b. NO_x Requirements under Section 182(f) of the CAA

In the previous 1-hour Maintenance Plan dated September 9, 1998, NO_x RACT requirements for utility boilers were implemented to demonstrate attainment and maintenance of the 1-hour ozone standard. These same requirements remain in place and are valid for the 8-hour standard.

(1) The Gadsby Plant owned by PacifiCorp underwent a RACT determination in 1990 as part of the SIP for particulate matter less than ten microns (PM₁₀) and is currently regulated under Section IX Part H of the SIP. Under that determination the facility was required to switch fuel from coal to natural gas and to use low NO_x burner technology. As a result, this facility is now operating within regulated limits specified in Section IX, Part H of the SIP.

(2) The Utah Power Plant owned and operated by Kennecott Utah Copper (KUC) underwent a RACT determination in 1995. KUC installed low NO_x burners, which meet an emission limitation of 216 lb/hr, and 426.5 ppm_{dv} (measured at 3 percent oxygen). This is equivalent to 0.50 lb NO_x/mmBtu. This was determined as RACT effective May 31, 1995.

1
2 **c. Rate of Progress (ROP) Reductions.**
3

4 The ROP requirements in section 182(b)(1) do not apply because EPA determined that Salt Lake
5 and Davis Counties attained the ozone standard on July 18, 1995 (60 FR 36723).
6

7 **d. Inspection and Maintenance (I/M) Programs**
8

9 The previous 1-hour maintenance plan, dated September 9, 1998, stated that Salt Lake and Davis
10 Counties had finalized the details of the improvements that would be included in the new I/M
11 programs. The new programs became effective in Davis County in 1998 and Salt Lake County in
12 2000. The standards for each county are different due to varying test procedures and average
13 vehicle speeds.
14

15 The current performance standards are based on MOBILE6 modeling of the current I/M and anti-
16 tampering programs. The MOBILE6 I/M performance standards for Salt Lake and Davis
17 Counties are presented in Tables 4 and 5. Additional information regarding I/M Program
18 Performance Standards is included in the TSD.
19
20

21 **Table 4. Salt Lake Co. – I/M Performance Standard**
22 (Emission Factors in grams/mile @ 30.8 mph)
23

Pollutant	2002	2005	2008	2011	2014
VOC	1.28	0.91	0.65	0.48	0.37
NO _x	1.22	1.01	0.67	0.47	0.34

24
25
26 **Table 5. Davis Co. – I/M Performance Standard**
27 (Emission Factors in grams/mile @ 36.6 mph)
28

Pollutant	2002	2005	2008	2011	2014
VOC	1.43	1.04	0.78	0.63	0.49
NO _x	1.30	1.06	0.73	0.55	0.40

29
30
31 **e. Major Source Applicability Cut-offs for Purposes of**
32 **RACT**
33

34 Cut-offs for major sources of VOC in the Salt Lake and Davis County attainment area are
35 identified in Subsection a(3) above. RACT requirements for these sources are in effect as defined
36 therein.
37

38 **f. Requirements that Do Not Apply**
39

40 The following requirements of 40 CFR 51.900(f) apply to serious, severe, and extreme ozone
41 nonattainment areas. They do not apply to the Salt Lake/Davis County area because it was

1 originally designated as a moderate nonattainment area. Thus, the anti-backsliding provisions do
2 not apply.

- 3
- 4 • Stage II Vapor Recovery
- 5
- 6 • Clean Fuels Fleet Program under § 182(e)(3) of the CAA
- 7
- 8 • Clean fuels for boilers under § 182(e)(3) of the CAA
- 9
- 10 • Transportation Control Measures (TCMs) during heavy traffic hours as
- 11 provided under § 182(e)(4) of the CAA
- 12
- 13 • Enhanced (ambient) monitoring under § 182(c)(1) of the CAA
- 14
- 15 • Transportation controls under §182(c)(5) of the CAA
- 16
- 17 • Vehicle miles traveled provisions under §182(d)(1) of the CAA
- 18

19 **g. Control Measure Carried Forward from the 1-hour** 20 **Ozone Plan**

21
22 The employer-based trip reduction program is included in the 1-hour maintenance plan, though
23 no credit is claimed, to reduce measurable miles driven by employees commuting to and from
24 work. It emphasizes numerous measures to reduce the drive-alone rate, including subsidized bus
25 passes, carpooling, telecommuting, and flexible work schedules. R307-320 is the State rule that
26 implements this program for all Federal, State and local government agencies in Salt Lake and
27 Davis Counties with 100 or more employees at a worksite. This program is used by government
28 agencies including public universities and school districts. It has proven to be a popular program
29 and is retained as a control measure in this 8-hour plan.
30

6. Contingency Measures

Requirements relating to Contingency Planning:

- *The State must develop a contingency plan that, at a minimum, will ensure that any violation of the 8-hour ozone NAAQS is promptly corrected. The plan should clearly identify the measures to be adopted, a schedule and procedure for adoption and implementation, and a specific time limit for action by the State. The schedule for adoption and implementation should be as expeditious as possible, but no longer than twenty-four months.*

a. Purpose of Contingency Planning

Section 110(a)(1) of the CAA and 40 CFR Part 51, *Requirements For Preparation, Adoption, and Submittal of Implementation Plans*, Subpart X, require the State to develop a maintenance plan that contains contingency provisions to ensure that any violation of the ozone NAAQS that may occur in the Salt Lake/Davis County area will be promptly corrected. Under the current 8-hour NAAQS, attainment areas are not necessarily required to have pre-selected contingency provisions, but rather a listing of measures that could be considered for future implementation, should they become necessary. The purpose of these controls in attainment areas is to achieve sufficient VOC and/or NO_x emission reductions to eliminate ozone violations, or to offset increases in VOC or NO_x emissions that might threaten the ozone standard. Implementing controls in response to ozone violations in attainment areas may occur without federal redesignation of an area to non-attainment.

When considering potential control measures, several factors were taken into consideration. Some controls interact with other controls, thereby decreasing overall effectiveness. For example, in the case of NO_x emissions, it has been found that reducing them under certain conditions may actually increase the development of ozone because NO_x can function as a scavenger of ozone. Major considerations that need to be considered in the choosing of viable control strategies are cost effectiveness, actual realized reductions with minimal lead time, and the overall benefit of the controls.

b. Determination of the Contingency Trigger Level and Date

It is the intent of the DAQ to periodically review the ambient monitoring data, emission inventories, growth projections, and other relevant data to determine whether contingency measures delineated in this plan should be implemented to maintain the 8-hour ozone standard. The Air Quality Board currently reviews monthly monitoring data at regularly scheduled meetings. As in the past, the AQB may implement contingency measures proactively to avoid a violation. In 1999, the board implemented a number of voluntary measures and state-only rules that helped the area to attain the 8-hour standard and be designated attainment.

If monitoring values are high enough to cause a violation of the current ozone standard, the DAQ, in consultation with EPA, will evaluate contingency measures and recommend those measures that would be most effective to correct the exceedance to the AQB. An action by the AQB will

1 function as the official triggering mechanism to activate any control measure. The date that the
2 AQB determines that one or more contingency or control measures should be implemented will
3 be the contingency trigger date.
4

5 **c. Timeliness of Contingency Actions**

6

7 The maintenance plan must also ensure that the contingency provisions are adopted expeditiously
8 once a need is determined. The State will normally have an appropriate amount of time to correct
9 a violation by implementing one or more of the contingency measures as necessary. In the event
10 that violations continue to occur after contingency measures have been implemented, additional
11 contingency measures would be implemented until the violations are corrected and the area has
12 returned to ambient concentration levels meeting the NAAQS.
13

14 As specified in (b) above, the date that the AQB determines that one or more contingency
15 measures should be implemented will be considered the contingency trigger date. Within 60 days
16 of the contingency trigger date, DAQ will begin evaluation of potential contingency measures.
17 Within 180 days of the trigger date, DAQ will present the recommended contingency measure to
18 the AQB. The AQB will then direct public hearings to consider the recommended contingency
19 measures along with any other contingency measures the Board believes may be appropriate to
20 effectively address the problem. Unless otherwise directed, the necessary contingency measures
21 will be adopted and implemented within eighteen months of the trigger date.
22

23 **d. Possible Contingency Measures**

24

25 One or more of the following measures will be evaluated for implementation if the conditions in
26 Subsection b. above occur. Measures will be chosen based on the specific needs of the violating
27 area, and their capacity to bring the area back into compliance quickly. It is likely that no federal
28 money will be available to fund the implementation of the selected control measures. Most, if not
29 all, of the costs involved will be assumed by local citizens, local industries, and state government
30 agencies. These control measures are not listed in any order of preference.
31

- 32 • *Alert Day Enhancements* - DAQ could expand the “Choose Clean Air” campaign, a
33 program designed to help individuals improve air quality by making smart choices.
34 The program would discourage the refueling of on-road vehicles during peak periods
35 of ozone formation by creating incentives to refuel later in the day. The program
36 would also include a voluntary restriction of the use of gasoline powered small
37 engines during the hottest period of the day.
38
- 39 • *Reduction of Truck Stop Idling* - This is a strategy that has been suggested at the
40 national level as a major environmental and energy issue. Truckers often stop to rest,
41 but leave their engines running for a variety of reasons. The US Department of
42 Energy is considering a model rule that would set uniform idling standards by
43 encouraging truck stop electrification. This would allow truck drivers to “plug in” to
44 keep accessories going while shutting down their engines. Utah could adopt a rule
45 limiting vehicle idling time while vehicles are not actually moving. This could
46 significantly reduce the amount of several criteria pollutants being released to the
47 atmosphere and at the same time reduce fuel waste.
48

- 1 • *Heavy Equipment Emission Control Program* - Institute an emission reduction
2 program for heavy construction equipment, school busses, and Utah Transit
3 Authority (UTA) vehicles. This could include incentives to encourage after-market
4 retrofit of heavy-duty diesel construction equipment and increased use of compressed
5 natural gas fueled school and UTA busses.
6
- 7 • *Reduce Emissions of VOCs* - Request voluntary commitments or enact measures to
8 reduce or restrict the release of VOCs from major sources during periods of peak
9 ozone formation. This could include industrial sources both within and outside the
10 ozone maintenance area whose pollutants may be transported into the maintenance
11 area by local wind patterns or meteorological processes. This could also include
12 refineries, waste water treatment facilities, chemical plants, and large painting
13 operations that emit most of their pollutants or precursors during the hottest time of
14 the day.
15
- 16 • *Identification of High-Polluting Vehicles* - Use remote sensing technology to identify
17 smoking and high-emitting vehicles that contribute a disproportionate amount of
18 emissions. This technology is available and was recently used in Cache County to
19 identify high polluting vehicles during the winter inversion season. Provide a
20 monetary incentive program to encourage repair of these vehicles at participating
21 repair shops.
22
- 23 • *Establish an Offset Ratio for NO_x* - R307-420 maintains the offset provisions of the
24 new source review program in Salt Lake and Davis Counties. This offset program
25 addresses growth in ozone precursors that are not adequately addressed in the current
26 models used for permitting under the Prevention of Significant Deterioration (PSD)
27 program. In 1999 the emissions thresholds were lowered for VOC. The thresholds
28 could be lowered for NO_x to further limit NO_x from new sources.
29
- 30 • *Implement More Effective Low-NO_x Burner Controls* – Existing sources in Salt Lake
31 and Davis Counties could be required to replace existing burners with low-NO_x
32 burners.
33
- 34 • Other VOC or NO_x emission control measures appropriate for the area based on
35 consideration of cost-effectiveness, emission reduction potential, social and
36 economic considerations, or other factors that the AQB may deem appropriate. It is
37 understood that new control measures may be developed in the future that could have
38 large impacts on emissions.
39

1 **7. Verification of Continued Ozone Maintenance**

2
3 *Requirements relating to Verification of Continued Attainment:*

4
5 - *The Maintenance Plan should indicate how the state will track the progress of*
6 *the Maintenance Plan.*

7
8 **a. Tracking System for the Verification of the Emission**
9 **Inventory**

10
11 Continued maintenance of the 8-hour ozone standard in Salt Lake and Davis Counties depends
12 upon the ability of the State to track VOC and NO_x emissions in future years. This is necessary
13 due to the fact that emissions projections made for the maintenance demonstration included in
14 this plan depend on assumptions of point, area, and mobile source growth. To verify continued
15 maintenance, the State will periodically update the VOC and NO_x emission inventories for Salt
16 Lake and Davis Counties. This updated emission inventory will be compared to the projections
17 contained in this plan to verify that they are within acceptable limits to maintain the ozone
18 standard.

19
20 **b. Provisions for Revising the Maintenance Plan**

21
22 As stipulated in Section 110(a)(2)(H) of the CAA, the State agrees to provide for review of this
23 maintenance plan and submission of a revised maintenance plan, if necessary. It is understood
24 that maintenance plans approved under section 110(a)(1) remain in effect for 10 years and are not
25 required to be adopted for a second ten-year period. It is further understood that contingency
26 measures approved as part of 110(a)(1) maintenance plans will remain in effect and that the
27 contingency measures could still be triggered if an area violates the 8-hour standard after the
28 initial 10-year period.

29
30 **c. Provisions for Prohibiting Transport of Emissions to**
31 **Other States**

32
33 If it is determined that emissions generated within the State of Utah interfere with attainment or
34 maintenance of a NAAQS in another state, DAQ will take steps, as necessary, to reduce those
35 emissions.